

PATENT  
Attorney Docket No. 99-432  
Application Serial No. 09/546,052

REMARKS

Claims 1-20 are pending in this application, with claims 1, 4, 9, 15, 16 and 17 being independent. Claims 1, 4, 9, 15, 16 and 17 have been amended. Favorable reconsideration and allowance are respectfully requested.

The Office Action rejected claims 1, 3-4, 6, 9, 11 and 14-17 under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,275,492 B1 to Zhang; claims 2, 5, 7-8, 10 and 12-13 under 35 U.S.C. § 103(a) as obvious from Zhang in view of U.S. Patent No. 6,310,883 B1 to Mann; and claims 18-20 under 35 U.S.C. § 103(a) as obvious from Zhang in view of U.S. Patent No. 6,542,469 B1 to Kelley. These rejections are respectfully traversed.

The present invention relates to a radio network routing protocol that reduces the amount of protocol traffic in mobile network routing, and overcomes bandwidth usage problems encountered in conventional mobile networks. To this end, the present invention utilizes a protocol that provides for routers that generate network topology information, and transmit that information to other routers.

As recited in independent claim 1, the present invention is directed to a router in a mobile radio network that includes functional units that allow it to generate network topology information in response to received link state information, place the topology information in a routing table and send the topology information in the routing table to another router in the mobile network. The router includes a memory that stores a

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routing table, a receiver for receiving link state routing information, and a processor. The processor determines the status of connections in the mobile network from received link state information, generates network topology information from the determined connection status, places the generated topology information in a routing table and transmits the network topology information in the routing table to another router in the mobile network.

Independent claim 16 is similar to claim 1, but is drafted in means-plus-function form. Independent claims 9 and 17 are directed to routing systems, which are recited as including routers having features similar to those recited in claims 1 and 16, respectively, as well as additional features. The router of claim 9, for example, has a processor which, responsive to received link state information, determines router connection information in the network, collects the determined information, and generates the network topology information from the collected router connection information. The router that is a part of the system of claim 17 also has means for performing the same processing as is done by the router of claim 9. Independent claim 4 is directed to a method of distributing network topology information in a radio network. The method of claim 4 involves processing similar to that done by the processor of the router of claim 1, with the addition of collecting determined device connection information. Independent claim 15 is directed to computer executable software code that performs a method having the same features as those recited in claim 4.

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Various routing techniques are known in computer network. One popular technique is Open Shortest Path First (OSPF) routing, in which network routers originate link-state advertisements (LSA). Such conventional OSPF techniques, however, have proven unfeasible for mobile networks, since they require synchronized databases. Mobile networks have attempted to utilize so-called HELLO messages to effect route discovery, in which a HELLO message is sent to other nodes, and are answered by other nodes with replies. Such HELLO messaging is problematic, however, since it generates an unacceptable amount of network traffic. Accordingly, OSPF has heretofore been unsuitable for mobile networks.

The present invention overcomes the drawbacks of HELLO messaging, by providing a processor which determines a status of connections in a mobile network, and generates network topology information based on that status. After generating the network topology information, the processor places the information in a routing table, and transmits the information in the table to at least one other router in the mobile network. This approach provides a robust network, free from the clogging associated with HELLO messaging.

Zhang, the Examiner's primary reference in rejecting all of the claims, relates to a method for routing data through a network. Zhang does not relate to a mobile network at all, and the purported invention of Zhang operates in a conventional OSPF environment (see, e.g., Zhang at col. 3, line 11-12).

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In applying Zhang, the Office Action points to col. 5, line 55 through Col. 6, line 10, and the associated Fig. 3. That portion of Zhang describes the following process: each router initially generates a routing table, based upon conventional Link State Advertisements that it has received. When a router receives a data packet, it examines the packet to determine whether it contains routing information. If it does, the router determines the so-called "next hop router" (i.e., the router to which the packet should be forwarded to next) from that routing information, and forwards the packet to that next hop router. If there is no routing information in the packet, the router determines the next hop router using its own routing table, and possibly modifies the packet to include valid routing information for the remainder of its journey.

This process is merely a procedure for routing packets, and is not in any way about a protocol for eliminating HELLO messaging in a mobile network, by determining a — status of connections in the mobile network, generating topology information based on the status, and after generating the topology information, placing it in a routing table and transmitting the topology information to at least one other router in the mobile network. In fact, in the portion of Zhang cited in the Office Action, there is no transmission of routing information in tables at all; there is merely the routing of data packets.

Accordingly, Applicants respectfully submit that Zhang cannot anticipate the present invention as recited in the independent claims.

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The other applied references do not correct the deficiencies of Zhang. Mann relates to a router finder for point to multi-point connection requests and Kelley to methods for determining at least two maximally disjoint pre-computed paths. Neither relates to a mobile network, and neither teaches or suggests the functions of the present invention discussed above.

The remaining claims all depend from one of independent claims 1, 4, 9, 15, 16 and 17, and each partakes in the novelty and non-obviousness of its respective base claims. The dependent claims also recite additional patentable features of the present invention, and individual reconsideration and allowance of each is respectfully requested.

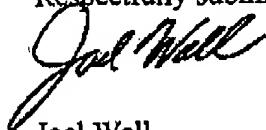
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CONCLUSION

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and early passage to issue of the present application.

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 07-2347. If an extension of time under 37 C.F.R. § 1.136 not accounted for above is required, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,



Joel Wall  
Reg. No. 25,648

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c/o Christian R. Andersen  
VERIZON CORPORATE SERVICES GROUP. INC.  
HQE03H14  
600 Hidden Ridge Drive  
Irving, TX 75038  
(972) 718 - 4800

**Customer Number 32127**